

Detecting Anomalies by Fusing Voice and Operations Data, Phase I

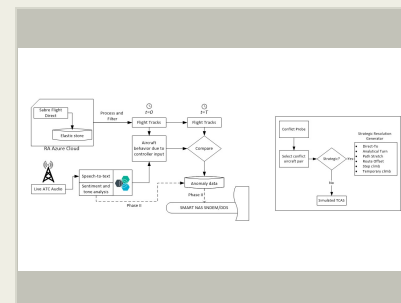
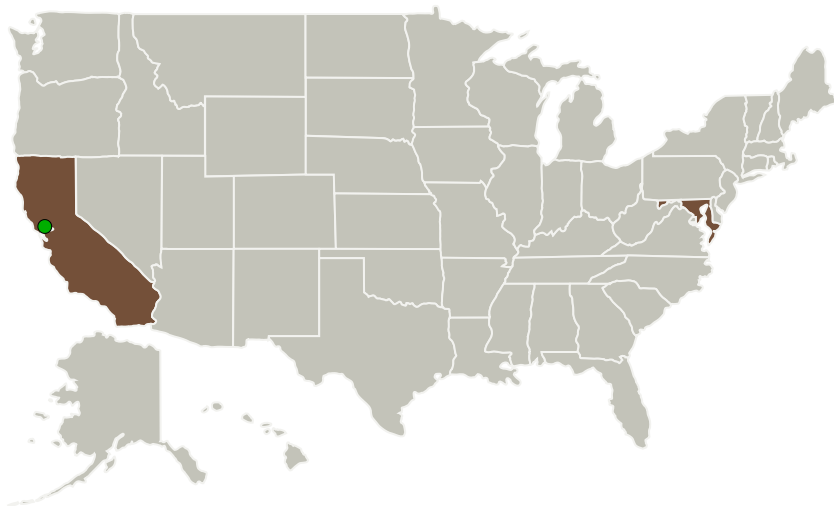
Completed Technology Project (2017 - 2017)



Project Introduction

Our innovation will detect, in near real-time, NAS operational anomalies by uniquely combining with analytical methods our existing Microsoft Azure based TFMDData flight information warehouse, live Air Traffic Control (ATC)-Pilot voice communication records, and IBM Watson capabilities such as natural language processing. Implementation of our proposed capability will fill one of the gaps for monitoring and predictive safety tools in the terminal area. In the enroute domain, predictive metrics such as the Monitor Alert Parameter (MAP) and "going red" forecasts help traffic flow managers balance traffic and workloads, thereby increasing safety. However, this relies on the assumption that ATC-pilot communication is of superior quality, unambiguous, and strictly procedural. Also, pilots reacting to controller resolutions by changing the trajectory of the aircraft (either using lateral or vertical maneuvers) may react late, react wrongly, or not react at all. We aim to find these anomalies by correlating actual flight trajectory data and ATC voice communication data. While these anomalies could be precursors to unsafe events, we view them as indicators of inefficiencies in flight operations. Identifying these inefficiencies through innovative data mining methods can uncover unique and recurring problems that otherwise go undetected. Our concept will also provide better insight into the frequency and content of controller instructions and interventions.

Primary U.S. Work Locations and Key Partners



Detecting Anomalies by Fusing Voice and Operations Data, Phase I Briefing Chart Image

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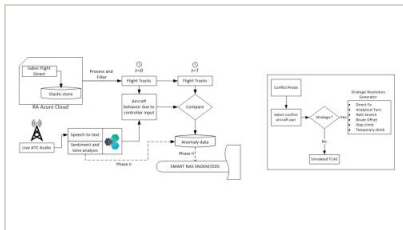
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Organizations Performing Work	Role	Type	Location
Robust Analytics	Lead Organization	Industry Women-Owned Small Business (WOSB)	Crofton, Maryland
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations

California	Maryland
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Images



Briefing Chart Image

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Briefing Chart Image
(<https://techport.nasa.gov/image/136704>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Robust Analytics

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

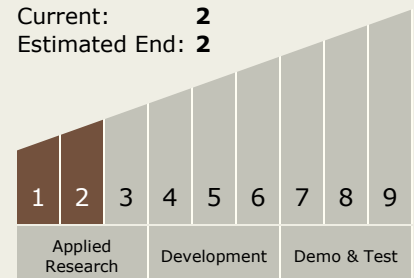
Carlos Torrez

Principal Investigator:

Peter F Kostiuk

Technology Maturity (TRL)

Start: 1
Current: 2
Estimated End: 2



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Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
 - └ TX16.3 Traffic Management Concepts